DocuPrint 240A/340A

HP-GL, HP-GL/2 Emulation Settings Guide

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Preface

Thank you for choosing this printer.

This manual explains how to set up the printer to perform HP-GL/2 emulation. Be sure to read this manual first to ensure proper use of this product.

Note that this manual is written for users who have basic knowledge of the operating environment and operation method as well as the method of using the printer.

Keep this manual handy for a quick reference to ensure full and efficient use of this product.

Types of Manuals

Manuals Bundled With the Machine & Their Contents

Setup and Quick Reference Guide	Explains how to install this printer, load paper, and troubleshoot of this printer.
The Online Help for the CentreWare Internet Services	Explains how to set the items and features of CentreWare Internet Services.
The Online Help for the printer driver	Explains how to set the items and features of the printer driver.
User Guide (PDF)	Explains printer settings, and describes control panel menu items and daily care in detail. This PDF file is included in the CD-ROM bundled with this printer.
Network Print Environment User Guide (PDF)	Explains how to set the printer for the network environment to use this printer as a network printer. This PDF file is included in the CD-ROM bundled with this printer.
HP-GL, HP-GL/2 Emulation Settings Guide (PDF)	Explains how to set the emulation mode for HP-GL and HP-GL/2. This PDF file is included in the CD-ROM bundled with this printer.

Manuals Bundled With Optional Accessories

User Guide (PostScript® Software Kit) (PDF)	Explains how to set the printer as a PostScript printer and the items that can be set in the printer driver. This PDF file is included in the CD-ROM bundled with the PostScript software kit.
Installation Guide	Explains how to install each optional accessory.

Note
• Adobe® Acrobat® Reader needs to be installed to display PDF files.

Contents

List of Mode Menu (HP-GL)

Using This Guide

Prerequisite Knowledge

Read this guide in detail before using this printer. If you are not familiar with the machine to which the printer is to be connected or the basic operations or concepts of the software, read the relevant manuals first.

Machines and software to which the printer is to be connected refer to personal computers, workstations, networks, and the respective operating systems and applications on which these machines run.

Organization

The following is a summary of each chapter.

1. Using Emulation

This chapter explains the available interfaces and fonts, emulated printers, and doing operations with the default settings.

2. HP-GL Mode Settings

This chapter explains the printer settings needed to use HP-GL emulation.

3. Materials Related to HP-GL Mode

This chapter explains the hard clip area, number of printable digits for various paper sizes, and auto layout among other functions.

Conventions

1. In this guide, "computer" refers to both the personal computer and workstation.

2. The following icons are used in this guide:

Important	Indicates important information which you should read.
Note	Indicates additional information on operations or features.
Refer to	Indicates reference sources.

3. The following conventions are used in this guide:

Refer to "xxx"	:	The cross-reference is within this guide.
Refer to xxx	:	The cross-reference is not within this guide.
[ ]	:	Indicates items displayed on the computer and the printer control panel. Also indicates the title of printed report/lists from the printer.
< >	:	Indicates items such as hard buttons and indicators on the keyboard and printer.

1   Using Emulation

1.1   About Emulation

This chapter explains HP-GL, HP-GL/2 emulation of the print language available on this printer.

Print data follows certain rules (grammar). These rules (grammar) are called a print language.

This printer supports a page description language used to create images on a page basis and an emulation feature used to obtain the print result similar to that obtained by another printer. The ability to obtain the print result similar to that obtained by other printers is called emulation.

Emulation Mode

When printing data written in a language other than the page description language supported by this machine, place this printer in the emulation mode. This printer has more than one emulation mode. The following table summarizes the relationship between the HP-GL, HP-GL/2 emulation mode and the printer type to be emulated.

Emulation mode	Emulated printer
HP-GL emulation mode (HP-GL mode)	7586B or DJ750C Plus
HP-GL/2 emulation mode (HP-GL/2 mode)	DJ760C Plus

In the HP-GL mode, the modes switch between the HP-GL mode, HP-GL/2 mode, and HP-RTL.

For the HP-GL/2 mode, the mode is fixed as HP-GL/2 and HP-RTL.

Host Interfaces and Emulation

Different host interfaces support different print languages. Host interfaces that support print languages are as follows:

- Parallel port
- Serial port
- LPD port
- NetWare port
- SMB port
- IPP port
- USB port
- Port9100 port

Switching Between Print Languages

This printer supports multi-emulation, allowing you to switch between print languages.

There are three methods of switching between print languages.

Switching by Commands

Commands for switching between print languages are provided. Upon receipt of a command, this printer selects the relevant print language.

Automatic Switching

This printer analyzes the data received by the host interface to identify the print language to be used. It then switches to the identified print language automatically.

Interface-dependent

Set a print language for each host interface using the control panel. Switch to the print language corresponding to the host interface that received data.

Mode Menu Screen

This screen is used to set items specific to HP-GL emulation mode. Press the <Menu> button to display the HP-GL mode menu screen and then select [HPGL] in [Print Language].

```
HPGL
    Features Menu
```

Refer to
• Information on HP-GL mode menu items: "2 HP-GL Mode Settings" (P. 13)

1.2　Default Settings

You can print in the following ways with the HP-GL and HP-GL/2 emulation modes set to the default settings. The document data is enlarged or reduced (auto layout) to match the size of the paper being used.

Document Size: Auto, Coord. Rotation: 0, Zoom Mode: Output Size, Zoom: On

Document size　　　　　　　　　　　　　　Output size
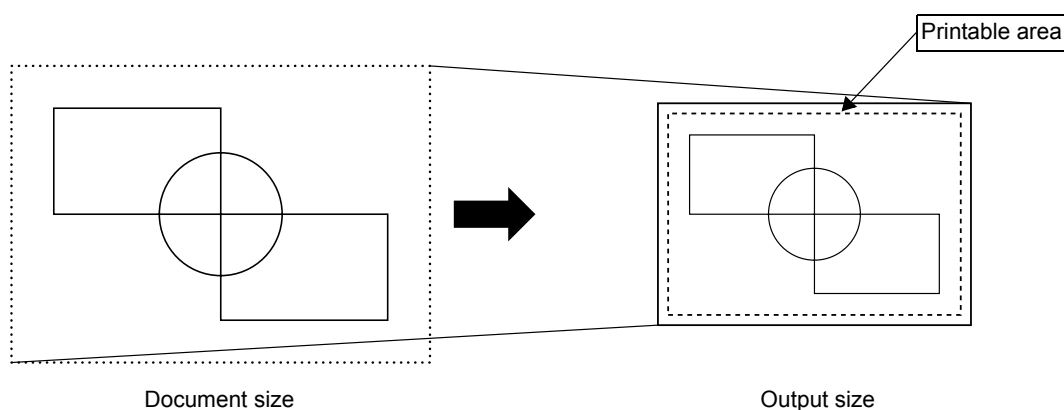
Note
• If necessary, you may change the default settings. See "2 HP-GL Mode Settings" (P. 13) for information on changing settings.

Limits During Auto Layout Mapping

When the Hard Disk (Optional) Is Installed in the Printer

Print data is stored to the hard disk when Auto Layout is executed.

When the Hard Disk (Optional) Is not Installed in the Printer

Print data is stored to the Auto Layout memory when [auto layout function] is executed. The initial capacity of the Auto Layout memory is 64 KB. Therefore, this printer cannot correctly output auto layout if the print data received by the auto layout memory exceeds 64 KB. In this case, change the size of the Auto Layout memory from the printer control panel. The upper limit of the Auto Layout memory is 5,120 KB. The auto layout memory cannot accept data larger than 5,120 KB.

We recommend installing the hard disk (optional) to this printer if you are going to use the auto layout function.

Paper Margin

The default output size is set to [A Size]. If the print data exceeds the effective coordinate area at all, it will be printed on the next larger size (for example, the next paper larger than A5 is A4). When paper margin is set, the area set for the paper margin rather than the area recognized by [Area Determine] sets the effective coordinate area. Do these settings if printing is done on a paper size larger than the size you want. Setting range is from 0 to 99 mm. The default value is 0 mm.

Refer to
• "2 HP-GL Mode Settings" (P. 13)

1.3   About Fonts

This section explains about the fonts that can be used in the HP-GL emulation mode.

Usable Fonts

The following fonts can be used in HP-GL emulation.

• Stroke font

Font Cache

To ensure high-speed printing, outline fonts are cached if they are not too large.

Outline fonts are converted to bit map data temporarily and then printed. To minimize this processing time, the processed bit map data is saved in the memory.

This process is called font cashing.

The saved bit map data is erased at power-off or system reset.

1.4　Eject Function

This section explains the eject function. There are two types of eject functions as shown here.

- The remaining data is forcibly ejected.
- All the jobs in the printer are eliminated.

To Forcibly Eject Remaining Data

For HP-GL and HP-GL/2 emulation modes, data is not ejected until a full page of data has accumulated. When using a parallel interface, if operations stop while the data for the last page is being transferred, the printer waits for the next data until the time set [Auto Eject Time] has passed, and the "Waiting for data" appears in the display.

In this kind of situation, forced eject does not wait for automatic eject and just forces all of the data in the printer to print out.

The procedure is shown below.

Note
- When "Waiting for data" appears in the display, the next job sent to the printer may not be printed correctly. Send the next job after forced eject or after the automatic eject time has been exceeded.

Refer to
- Auto Eject Time: User Guide 4.2 Description of Menu Items

1. Press the <Eject/Set> button when the display shown to the right appears.

   Printing will start.

   When printing is finished, "Ready to print" appears in the display.

```
┌────────────────────────────┐
│  ┌──────────────────────┐  │
│  │ Waiting for data     │  │
│  │ Parallel             │  │
│  └──────────────────────┘  │
│        <Eject/Set> button  │
│  ┌──────────────────────┐  │
│  │ Ejecting...          │  │
│  │ Parallel      Tray1  │  │
│  └──────────────────────┘  │
│            ↓               │
│  ┌──────────────────────┐  │
│  │ Ready to print       │  │
│  │                      │  │
│  └──────────────────────┘  │
└────────────────────────────┘
```

Important
- When the common menu item [Print Mode] is set to [Auto], "Waiting for data" does not appear, so forced eject does not occur.
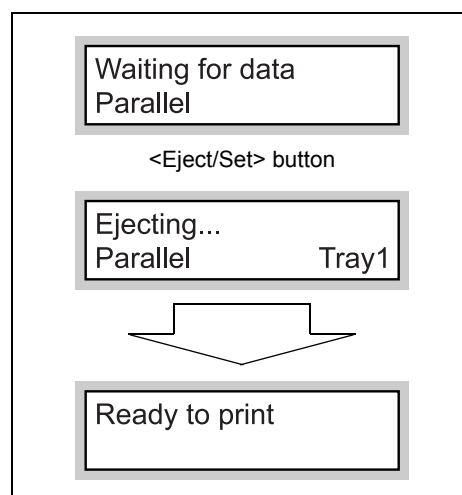
To Eject All Jobs in the Printer

Print all the jobs that the printer has received.

Through this procedure, you can interrupt the receiving of data and empty the buffer. The procedure is explained below.
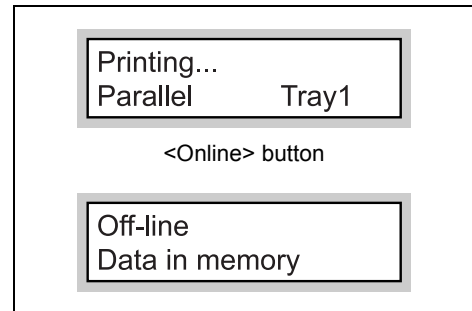
1. Press the <Online> button when the display shown to the right appears.

Note
• Press the <Online> button to make the printer automatically stop receiving data.

```
┌──────────────────┐
│ Printing...      │
│ Parallel    Tray1│
└──────────────────┘
```
<Online> button

```
┌──────────────────┐
│ Off-line         │
│ Data in memory   │
└──────────────────┘
```

2. Press the <Eject/Set> button.
    Printing will start.

<Eject/Set> button

```
┌──────────────────┐
│ All data         │
│ Ejecting...      │
└──────────────────┘
```

All the jobs are printed and "Off-line" appears in the display.

Note
• When a parallel interface or USB interface is being used, depending on when the <Online> button is pressed in step 1, data reception may occur in the middle of a job.
  In this situation, data after that is recognized as a new job, after the <Eject/Set> button is pressed, and processed like a new job after releasing offline in step 3.

```
┌──────────────────┐
│ Off-line         │
│                  │
└──────────────────┘
```
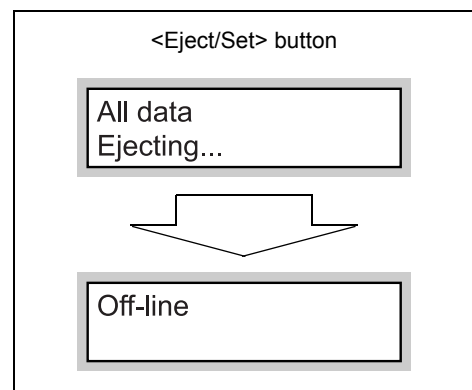
3. Press the <Online> button.
    "Ready to print" appears in the display.

Note
• After "Ready to print" appears, data that is being processed as a new job may not be printed correctly if [Print Mode] is set to [Auto] in the common menu.

<Online> button

```
┌──────────────────┐
│ Ready to print   │
│                  │
└──────────────────┘
```
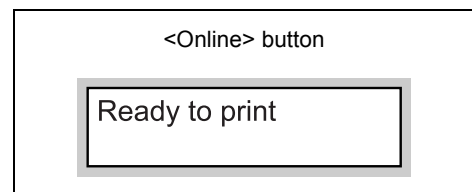
2　HP-GL Mode Settings

2.1　About Mode Menu

This section explains the types of menus and the levels of the emulation mode menu.

This Printer's Menus

In the menus, there are Mode menu for emulation settings and Common menu for the printer and other settings.
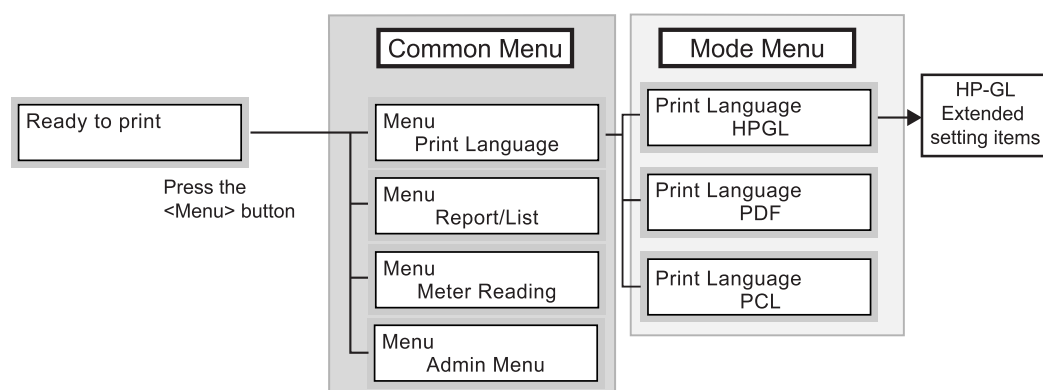
You can set the following items in the common menu when using HP-GL, HP-GL/2, and HP-RTL emulation.

- Port Status (Parallel/Serial/LPD/NetWare/SMB/IPP/USB/Port9100)
  Set the port that uses HP-GL, HP-GL/2, and HP-RTL emulation to [Enable].

- Print Mode (Parallel/Serial/LPD/NetWare/SMB/IPP/USB/Port9100) (Default: [Auto])
  Set port print mode so that you can use HP-GL emulation. Select [HPGL/2] or [Auto] as the print mode.

- HP-GL Auto Layout

Refer to
- User Guide 4.2 Description of Menu Items

About Mode Menu

This HP-GL mode menu is used to set items specific to HP-GL and HP-GL/2 emulation.

You can change the mode menu settings while the printer is printing. When this is done, the changed settings take effect from the next job.

The mode menu is configured from the following levels.

• Mode menu > Menu item > Item > Candidate value

Note
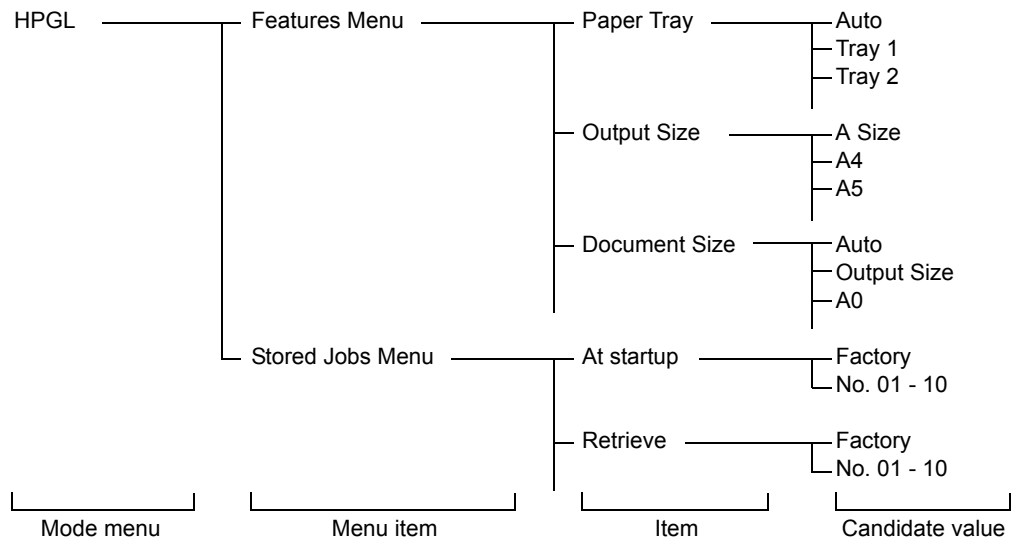• Some menu items do not have items.
  Sometimes the items are divided into item 1, item 2, and item 3. (Called item hereafter.)

```
HPGL ———————— Features Menu ——————— Paper Tray ———————— Auto
                                                      ├ Tray 1
                                                      └ Tray 2

                                      Output Size ——————— A Size
                                                      ├ A4
                                                      └ A5

                                      Document Size —————— Auto
                                                      ├ Output Size
                                                      └ A0

              Stored Jobs Menu ——————— At startup ——————— Factory
                                                      └ No. 01 - 10

                                      Retrieve ——————————— Factory
                                                      └ No. 01 - 10

   Mode menu          Menu item             Item           Candidate value
```

The diagram shown above represents a portion of the levels in the HP-GL mode menu.

Refer to
• Operations and items that can be set: "2.2 HP-GL Mode Menu Settings" (P. 15)

2.2 HP-GL Mode Menu Settings

This section explains the items that can be set using HP-GL mode menu and the setting procedures.

List of HP-GL/2 Setting Items

This section explains the items that can be set using HP-GL mode menu.

Features Menu

Paper Tray

Sets the paper tray that supplies paper.

Candidate values are shown below.

[Auto] (default)

The printer searches for the paper tray that has the paper size set in [Output Size] and paper is fed from that tray.

[Tray 1]

[Tray 2]

[Tray 3]

[Tray 4]

Important
• When [Tray 1] to [Tray 4] are selected, the [Output Size] item cannot be set because the paper loaded in these trays become the output sizes.

Note
• When [Auto] is selected and the same size and type of paper is loaded in the same orientation in multiple trays, the paper tray will be selected according to the tray priority settings and paper priority settings in the common menu.
• When the same size of paper is loaded in different orientations in multiple trays, the paper loaded in landscape is given priority.
• When the optional trays are installed, [Tray 3] and [Tray 4] appear in the display.

Output Size

Sets the size of the paper to print on.

Candidate values are shown below.

■ When the [Paper Tray] is set to [Auto].

[A size] [A4] [A5] [B5] [Auto]

■ When the [Paper Tray] is set to [Tray 1] to [Tray 4].

The paper size loaded in the tray that is set appears in the display. [Output Size] cannot be set.

Note
• If the paper size loaded in the tray is unknown, then [**] appears in the display.

Document Size

Sets the Client-Created document size.

Candidate values are shown below.

[Auto] (default)

[Output Size]

The size is the same as that set in [Output Size].

[A0] [A1] [A2] [A3] [A4] [A5] [B0] [B1] [B2] [B3] [B4] [B5]

Note
- If [Auto] is not selected, the [Auto Layout] setting switches to [Off].
- If [Auto] is not selected, the [Zoom Mode] setting switches to [Output Size].

Coord. Rotation

Sets the paper orientation for printing.

Candidate values are shown below.

[0] (default)

Paper orientation is set as landscape.

[90]

Paper orientation is set as portrait.

Gradation Mode

Sets the gradation for printing.

Candidate values are shown below.

[Grayscale] (default)

[Black Pen]

Auto Layout

Turns on or off the auto layout function.

Candidate values are shown below.

[On] (default)

[Off]

Note
- [On] only appears in the display when [Auto] is selected in [Document Size].
- When [Off] is selected, the [Zoom Mode] setting changes to [Output Size].

Palette Setup

Specifies the palette to be used.

Candidate values are shown below.

[Command] (default)

[Stored Jobs]

Quantity

■ Enter Quantity

Sets the number of copies to be printed.

You can set the number in a range from 1 to 250. The default value is 1.

Important
- The number of copies specified by the client is used when printing. After printing, that value can also be changed on the printer control panel. But, if the number of copies was specified from a NetWare, or LPD port, then the value set on the printer control panel cannot be changed after printing is finished.

■Quantity Setup

Sets the method to specify the number of copies to print. Candidate values are shown below.

[Protocol] (default)

[Stored Jobs]

[Command]

2 Sided Print

Sets 2 sided printing.

[Off]

2 sided printing is not done.

[Long Edge Flip]

Printing is done from left to right.

[Short Edge Flip]

Printing is done from top to bottom.

Note
• Can be set when the duplex unit (optional) is installed.

Output Tray

Specifies the tray to which the printed paper is ejected.

[Center Tray] (default)

[Rear Tray]

[OffsetCatchTray]

Note
• You can set [Rear Tray] when the optional rear tray is installed.
• You can set [OffsetCatchTray] if the optional offset catch tray is installed.

Adjust Position

Moves the hard clip area vertically or horizontally. This setting can be made in 1 mm increments within the range between -250 and +250.

■[Up & Down]

You can set this item in 1 mm increments from -250 to 250mm. (-9.8 to 9.8 inches in 0.1 inch increments)

The default value is [0 mm].

■[Left & Right]

You can set this item in 1 mm increments from -250 to 250mm. (-9.8 to 9.8 inches in 0.1 inch increments)

The default value is [0 mm].

Note
• Data outside the print area will not be printed even if the position is adjusted.
• Data that has gone out of the print area as the result of positional adjustment will not be printed.
• When changing the candidate values by the <▲> or <▼> button, you can change the display continuously by holding the button down. Also, pressing the <▲> and <▼> buttons simultaneously displays the default value.

Print Control

■ HP-GL Mode

Switches between graphics languages. This setting affects HP-GL commands (IW, OW, and UC commands).

Candidate values are shown below.

[HP-GL] (default)

You can use HP-GL, HP-GL/2, or HP-RTL. The languages switch according to the print data that is sent to the printer.

[HP-GL/2]

HP-GL/2, or HP-RTL can be used.

■ Hard Clip

Sets the size of hard clip area.

In the HP-GL mode, the drawing area is limited depending on the paper size. This area is called a hard clip area. It determines the maximum range of pen movement. Accordingly, images cannot be drawn exceeding the bounds of the hard clip area.

Candidate values are shown below.

[Output Size] (default)

Set the hard clip area to the same size as the paper. However, the actual area that can be printed is whatever is the area on which the printer can print.

[Normal]

The hard clip area for A4, A3, letter, and ledger are the same as for Hewlett-Packard's HP7550A.

The hard clip area for other paper sizes is the same as the printable area for this printer.

■ Eject Command

Set commands (SP, SP0, NR, FR, PG, AF, and AH) that indicate completion of drawing. At receipt of one of these commands, drawing is terminated and paper is ejected. All commands except for SP0 are set to [Disable] as the default.

Note
• When two or more commands are specified, drawing stops and paper is ejected at receipt of any one command.

■ Zoom

Determines whether to enlarge/reduce (scaling) the document size so that the document size fits the output size.

[On] (default)

Scaling

[Off]

Scaling is not done. Print data is printed at actual (100%) size.

Because of this, the print data may not fit on the paper.

■Zoom Mode

Determines whether to use A-sizes (A0, A1, A2, A3, A4, and A5) or the effective coordinate area obtained by the method selected in the area determining mode for auto scaling.

Candidate values are shown below.

[Output Size] (default)

Paper sizes are automatically selected from the six sizes in the A series of paper sizes (A0, A1, A2, A3, A4, and A5).

[Coordinate Area]

Document sizes are determined by the effective coordinate area after the paper margins have been calculated according to the method selected in [Area Determine].

Note
• If anything except [Auto] is selected in [Document Size], then the [Coordinate Area] cannot be selected.
• [Coordinate Area] setting can only be done if [Auto Layout] is [On]. If it is set to [Off], [Output Size] takes effect.

■Area Determine

Specifies the method of obtaining the effective coordinate area for auto scaling.

Candidate values are shown below.

[Auto] (default)

Select a method to determine the printable area from either IW, IP, Adapted, or PS. The order of priority is PS > IW > IP > Adapted.

[IW]

The effective coordinate area is set to the area specified by the last IW command in the data. If there are no IW commands in the data, Adapted determines the effective coordinate area.

[IP]

The effective coordinate area is set to the area including what is specified by IP commands in the data. If there are no IP commands in the data, Adapted determines the effective coordinate area.

[Adapted]

The effective coordinate area is determined by the following conditions.

• The maximum and minimum positions mapped by the commands.

• The largest font size on that page.

• The widest line.

[PS]

The effective coordinate area is set to the area specified by the first PS command in the data. If there are no PS commands in the data, [Adapted] determines the effective coordinate area.

■Paper Margin

Sets the paper margin for auto scaling.

You can set this item in 1 mm increments from 0 to 99 mm (0.0 to 3.9 inches in 0.1 inch increments). The default value is [0 mm].

Note
• When changing the candidate values by the <▲> or <▼> button, you can change the display continuously by holding the button down. Also, pressing the <▲> and <▼> buttons simultaneously displays the default value.

■Image Enhance

Enables or disables image enhancement.

Image enhancement raises the resolution and smooths sharp edges.

Candidate values are shown below.

[On] (default)

[Off]

Important
• The [Zoom Mode], [Area Determine], and [Paper Margin] settings are effective only when [Document Size] is set to [Auto].

Pen Attributes

Sets attributes of 16 pens (No. 00 to 15).

The thickness and color of the drawing line can be specified.

■Pen Width

Sets the width of the pen (thickness of the line). The pen width can be specified in steps of 0.1 mm within the range between 0.0 and 25.5 (0.00 to 1.00 inch in 0.01 inch increments).

The default is [0.3 mm].

Note
• When changing the candidate values by the <▲> or <▼> button, you can change the display continuously by holding the button down. Also, pressing the <▲> and <▼> buttons simultaneously displays the default value.
• When an image is reduced by combining the [Document Size] setting and [Output Size] setting, the pen width is also reduced (minimum pen width = 0.1 mm (0.01")).
• The line width is increased starting in the center of the line.
• When 0.0 is specified, nothing is drawn.

■Line End

Sets the line end shape.

[Cut] (default)

•: Coordinate specification position

[Round]

•: Coordinate specification position

[Rectangle]

•: Coordinate specification position

■Line Intersect

Sets the intersection shape.

[None] (default):   [Cut]:

[Round]:   [Join]:

Note
• [None] requires the shortest processing time and therefore is suitable for check.
• When a symbol is specified with a symbol mode command, live concatenation is not performed. "Symbol mode command" refers to an HP-GL command used to specify a symbol.

■ Density

Sets pen color density. The setting range is 0 to 100% in 5% increments. The default for pen No. 00 is 0%, and the defaults for pens No. 02 through No. 15 are 100%.

Note
• When changing the candidate values by the < ▲ > or < ▼ > button, you can change the display continuously by holding the button down. Also, pressing the < ▲ > and < ▼ > buttons simultaneously displays the default value.

Stored Jobs Menu

Settings can be registered to NV memory (No. 01 to 10) and called up as required.

At startup

[At startup] refers to the reading of non-volatile memories (No. 01 to 05) pre-registered by [Store] when the power is switched on or the system is reset.

Sets the No. of the NV memory to call up.

The default is [Factory], which means that the default settings are called up when the printer is started up.

Retrieve

This feature calls up pre-registered settings.

Sets the No. of the memory to call up.

The default is [Factory], which means that the default settings are called up.

Store

There are two types of memory, ROM for storing defaults, and NV memory (No. 01 to 10) for holding user settings.

By registering to memory, the various preset mode menu settings are registered as a group to NV memory (No. 01 to 10).

Registering these settings in advance makes it easier to call up mode menu settings, and you are no longer required to repeat the same settings each time after the printer is switched on.

Registered settings are held until you initialize NV memory or clear memory.

Delete

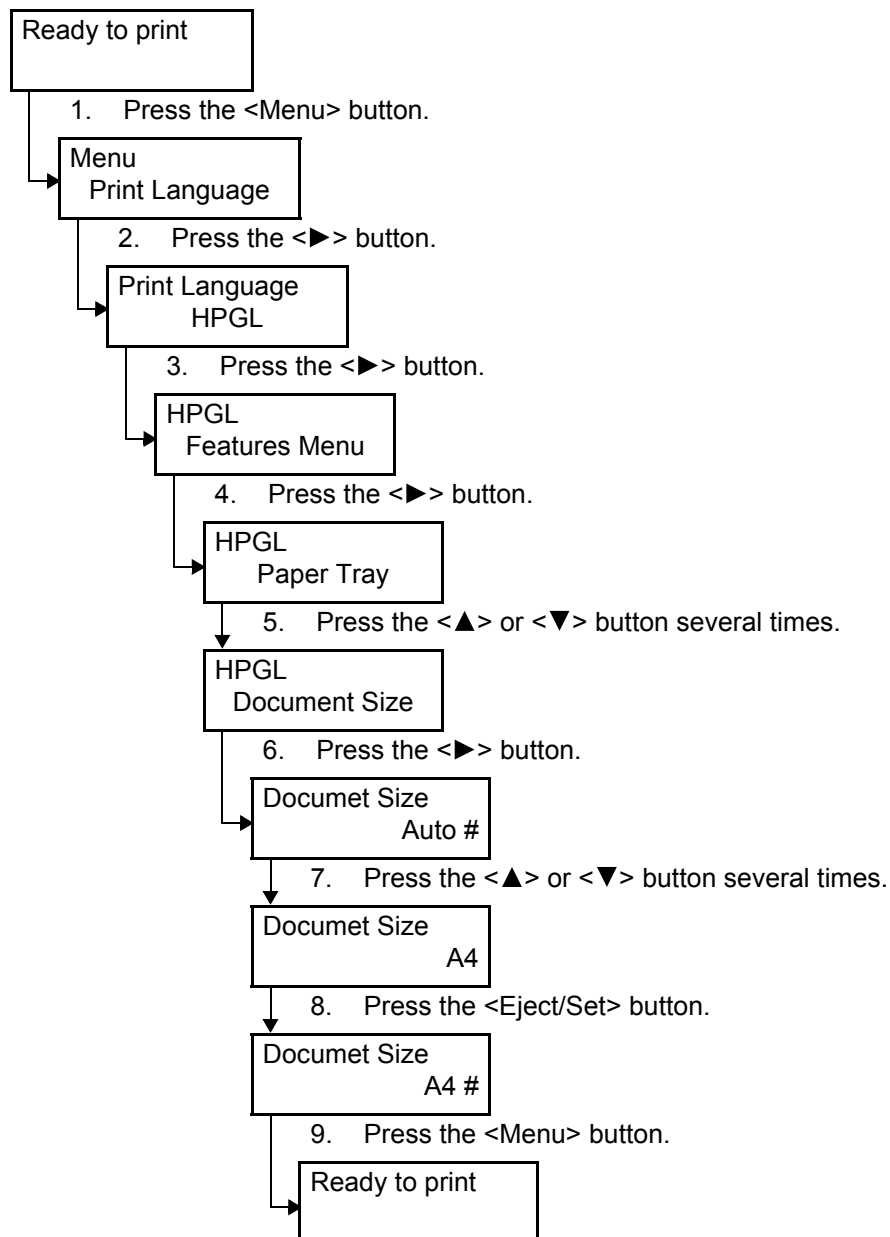Clears the settings registered to NV memory.

Sets the No. of the memory to clear.

Note
• [No.01] to [No.10] are not displayed if no settings have been registered to memory.
• We recommend pressing the <Online> button to set the offline mode when registering as the setting values sometimes differ if a command from a client arrives while you are registering to memory.

Setting the HP-GL Mode Menu

This section uses a document size of [A4] set in the HP-GL mode to explain the mode menu setting procedure.

```
┌─────────────────────┐
│ Ready to print      │
└─────────────────────┘
    1.   Press the <Menu> button.
┌─────────────────────┐
│ Menu                │
│   Print Language    │
└─────────────────────┘
    2.    Press the <▶> button.
┌─────────────────────┐
│ Print Language      │
│   HPGL              │
└─────────────────────┘
    3.    Press the <▶> button.
┌─────────────────────┐
│ HPGL                │
│   Features Menu     │
└─────────────────────┘
    4.    Press the <▶> button.
┌─────────────────────┐
│ HPGL                │
│   Paper Tray        │
└─────────────────────┘
    5.    Press the <▲> or <▼> button several times.
┌─────────────────────┐
│ HPGL                │
│  Document Size      │
└─────────────────────┘
    6.    Press the <▶> button.
┌─────────────────────┐
│ Documet Size        │
│           Auto #    │
└─────────────────────┘
    7.    Press the <▲> or <▼> button several times.
┌─────────────────────┐
│ Documet Size        │
│              A4     │
└─────────────────────┘
    8.    Press the <Eject/Set> button.
┌─────────────────────┐
│ Documet Size        │
│             A4 #    │
└─────────────────────┘
    9.    Press the <Menu> button.
┌─────────────────────┐
│ Ready to print      │
└─────────────────────┘
```

2.3 About the HP-GL Mode List

This section explains the HP-GL mode list.

Refer to
• For information about reports and lists: User Guide 6.2 Printing Reports/Lists

HP-GL/2 Mode List

• HP-GL/2 Settings List
You can confirm the HP-GL mode setting values.

- HP-GL/2 Logical Printers/Stored Jobs List
  You can confirm the setting values that are in the NV memory.

DocuPrint 340A-AP
HP-GL/2® Logical Printers/Stored Jobs List

Date/Time : 02/12/2003 11:39
Page : 1

Printer Number	No.1	No.2	No.3	No.4	No.5
Format					
Document Size	Auto	Auto	Auto	Auto	Auto
Output Size	A Size	A Size	A Size	A Size	A Size
Paper Tray	Auto	Auto	Auto	Auto	Auto
Auto Layout	On	On	On	On	On
Coordinate Rotation	0	0	0	0	0
Palette Setup	Command	Command	Command	Command	Command
Up & Down Adjustment	Off	Off	Off	Off	Off
Left & Right Adjustment	Off	Off	Off	Off	Off
Gradation Mode	Grayscale	Grayscale	Grayscale	Grayscale	Grayscale
Options					
2 Sided Print	1 Sided Print	1 Sided Print	1 Sided Print	1 Sided Print	1 Sided Print
Output Destination	Center Output Tray	Center Output Tray	Center Output Tray	Center Output Tray	Center Output Tray
Print Control					
HP-GL Mode	HP-GL	HP-GL	HP-GL	HP-GL	HP-GL
Image Enhance	On	On	On	On	On
Eject Command	SP0	SP0	SP0	SP0	SP0
Print Quantity Setup	Protocol	Protocol	Protocol	Protocol	Protocol
Quantity	1 set(s)	1 set(s)	1 set(s)	1 set(s)	1 set(s)
Zoom	On	On	On	On	On
Zoom Mode	Output Size	Output Size	Output Size	Output Size	Output Size
Area Determine Mode	Auto	Auto	Auto	Auto	Auto
Paper Margin	0mm	0mm	0mm	0mm	0mm
Hard Clip	Output Size	Output Size	Output Size	Output Size	Output Size

Pen Attributes (Width(mm) / Line End / Intersect / Density) — for each Printer No.1–No.5:

Pen	Width(mm)	Line End	Intersect	Density
No. 0	0.3	Cut	None	0
No. 1	0.3	Cut	None	100
No. 2	0.3	Cut	None	100
No. 3	0.3	Cut	None	100
No. 4	0.3	Cut	None	100
No. 5	0.3	Cut	None	100
No. 6	0.3	Cut	None	100
No. 7	0.3	Cut	None	100
No. 8	0.3	Cut	None	100
No. 9	0.3	Cut	None	100
No.10	0.3	Cut	None	100
No.11	0.3	Cut	None	100
No.12	0.3	Cut	None	100
No.13	0.3	Cut	None	100
No.14	0.3	Cut	None	100
No.15	0.3	Cut	None	100

Print Method

On the control panel, select [Report/List] > [Print Language] > [HP-GL/2 Settings] or [HP-GL/2 Logical].

3 Materials Related to HP-GL Mode

3.1 Hard Clip Area

In the HP-GL mode, the plottable area is determined (separately from the printable area) depending on the paper size. This area is called a hard clip area. It determines the maximum range of pen movement. Accordingly, images cannot be drawn exceeding the bounds of the hard clip area. This printer allows you to select a hard clip area from the following:

• Normal
  Defines the printable area of this machine as the hard clip area.

• Output Size
  Defines the output size equivalent as the hard clip area. Actually, images can be printed only within the printable area.

The hard clip area can be specified by making the HP-GL emulation mode setting or using the hard clip specification command [&l].

The following coordinate values are set when the origin is set at the lower left of the A3-size paper (Auto Layout is specified for HP-GL/2).
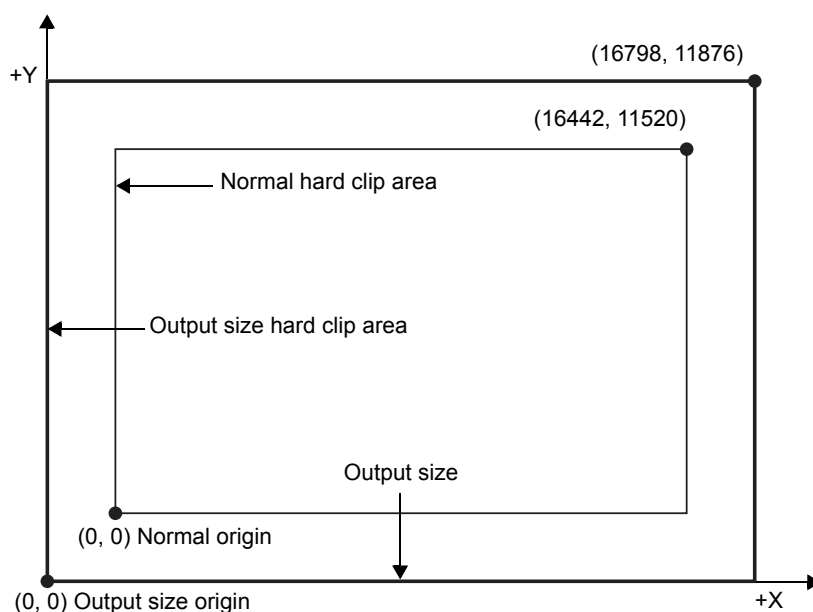
3.2　Printable Area

Printable areas in the HP-GL mode are as follows:

Note
• Some output sizes may not be used depending on the printer type.

Output Sizes and Printable Areas

| Output size | Paper length (1/7200 in.) | | Coordinate value (1/7200 in.) | | | | | | | |
| | X-direction | Y-direction | Margin | | Printable area | | Top right | | Margin | |
	Width	Height	Bottom left X	Bottom left Y	Long edge	Short edge	Top right X	Top right Y	XR	YU
A3	119052	84168	1260	1260	116532	81648	117792	82908	1260	1260
A4	84168	59508	1260	1260	81648	56988	82908	58248	1260	1260
A5	59508	41940	1260	1260	56988	39420	58248	40680	1260	1260
B4	103176	72828	1260	1260	100656	70308	101916	71568	1260	1260
B5	72828	51588	1260	1260	70308	49068	71568	50328	1260	1260

Output size	Paper length (1/7200 in.)		Coordinate value (1/7200 in.)							
	X-direction	Y-direction	Margin		Printable area		Top right		Margin	
	Width	Height	Bottom left X	Bottom left Y	Long edge	Short edge	Top right X	Top right Y	XR	YU
A3	84168	119052	1260	1260	81648	116532	82908	117792	1260	1260
A4	59508	84168	1260	1260	56988	81648	58248	82908	1260	1260
A5	41940	59508	1260	1260	39420	56988	40680	58248	1260	1260
B4	72828	103176	1260	1260	70308	100656	71568	101916	1260	1260
B5	51588	72828	1260	1260	49068	70308	50328	71568	1260	1260
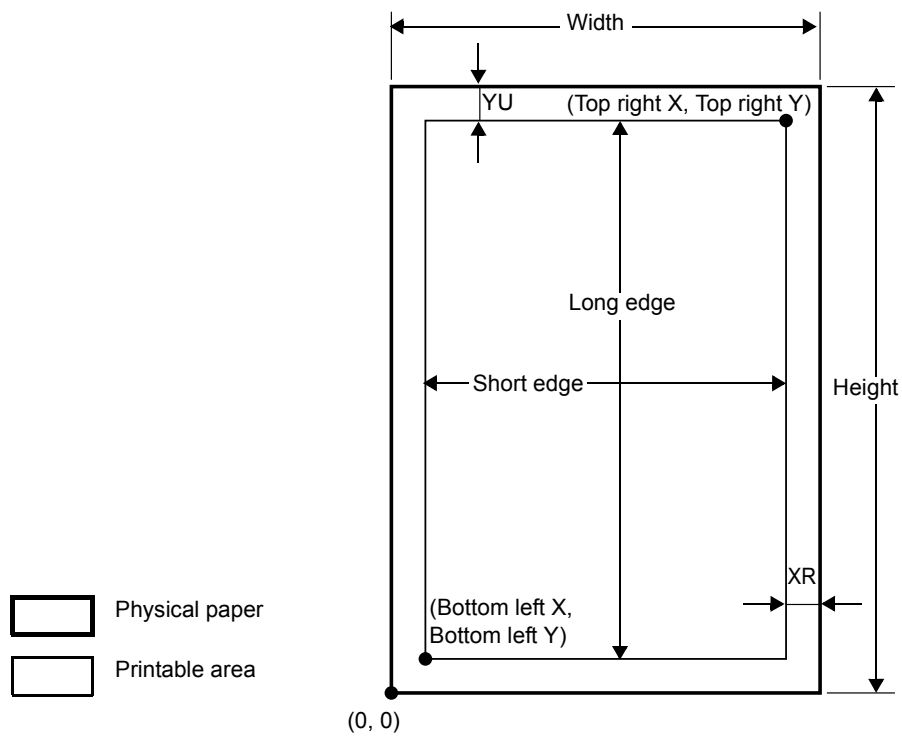
3.3   Auto Layout

This section explains auto layout.

What Is Auto Layout?

Auto layout is the function that judges the document size according to the HP-GL data input from the host system, enlarges/reduces the document so that it fits the paper size, and lays out the document at the center of the paper. Using the auto scale and auto layout functions allows you to print a document in HP-GL mode without regard for the document size and origin position.

All auto layout settings must be made on the operation panel of the printer. They cannot be made using advanced setting commands.

Making the Auto Layout Function Effective

To make the auto layout function effective, make the following settings on the control panel of the printer:

- Set [Document Size] to [Auto]. The default is [Auto].
- To set the origin position, set [Auto Layout] to [On].
- Set [Zoom] to [On]. The default is [On].
- Select the method of obtaining the effective coordinate area in [Area Determine]. The default is [Auto].
- Specify the paper margin by setting [Paper Margin]. The default is [0 mm] ([0.0"]).
- Set [Zoom Mode]. The default is [Output Size].

Details on Setting Items

Details on individual items are as follows.

Document Size

Setting [Document Size] to [Auto] allows you to set [Auto Layout] to [On].

Auto Layout

Setting set [Auto Layout] to [On] makes the [Zoom], [Area Determine], [Paper Margin], and [Zoom Mode] settings effective.

Zoom

The purpose of this setting is to determine whether to enlarge/reduce (scaling) the document size so that the document size fits the output size.

Area Determine

Methods for obtaining the effective coordinate area based on the HP-GL data are as follows:

[Auto]

An effective coordinate area determining method is automatically selected among PS, IW, IP, Adapted. PS, IW, IP, Adapted are given priority in this order.

[IW]

The area specified by the last IW command in data is determined as the effective coordinate area. If data contains no IW command, Adapted is used to determine the effective coordinate area.

[IP]

The area containing the area specified by all IP commands in data is determined as the effective coordinate area. If data contains no IW command, Adapted is used to determine the effective coordinate area.

[Adapted]

The effective coordinate area is determined by the following conditions:

- Maximum and minimum position coordinates of the points plotted by drawing commands

- Maximum character size in the page

- Maximum pen width

[PS]

The area containing the area specified by the first PS command in data is determined as the effective coordinate area. If data contains no PS command, Adapted is used to determine the effective coordinate area.

Paper Margin

Specify the paper margin within the range between 0 mm (0.0") and 99 mm (3.9"). The default is [0 mm] ([0.0"]). The area obtained by removing the area specified by making the [Paper Margin] setting from the effective coordinate area obtained in [Area Determine] is determined as the effective coordinate area.

Paper margin

The image exceeding the bounds of the hard clip area is not plotted.
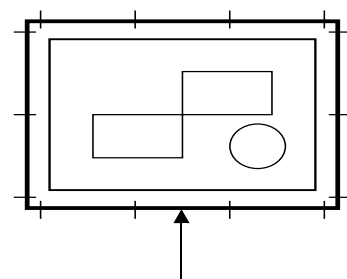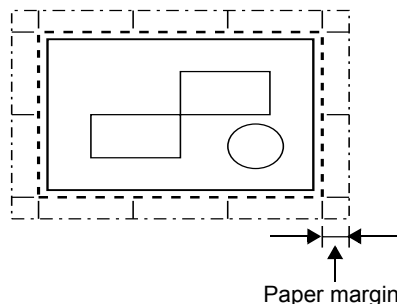
▯ Area obtained in [Area Determine]

▯ Area obtained by removing the area specified by making the [Paper Margin] setting from the effective coordinate area obtained in [Area Determine]

Zoom Mode

Select the mode that determines the document size according to the obtained effective coordinate area. Also determine whether the paper is set in landscape or portrait according to the effective coordinate area.

When set to [Coordinate Area]:

The area obtained by removing the area specified by making the [Paper Margin] setting from the effective coordinate area obtained in [Area Determine] is determined as the effective coordinate area.

When set to [Output Size]:

The document size is determined by the obtained effective coordinate area and origin position setting. The document size is selected from A sizes (A0, A1, A2, A3, A4, and A5).

Determining the Document Size

The document size is determined by comparing it with the hard clip areas of different sizes of paper based on the effective coordinate area obtained according to [Zoom Mode], [Paper Margin], and [Area Determine] settings.

When [Zoom Mode] Is Set to [Output Size]

1. The effective effective coordinate area is obtained from the input HP-GL data in the specified [Area Determine].

2. The size of the character specified in the page (or the default character size) or the value that is one half the specified pen width, whichever is larger, is added to the effective coordinate area obtained in 1 as a margin.

3. The area specified as a paper margin is removed from the effective coordinate area obtained in 2.

4. The size of the minimum area that contains the effective coordinate area obtained in 3 is determined as the document size.

When [Zoom Mode] Is Set to [Coordinate Area]

1. The effective coordinate area is obtained from the input HP-GL data in the specified [Area Determine].

2. The size of the character specified in the page (or the default character size) or the value that is one half the specified pen width, whichever is larger, is added to the effective coordinate area obtained in 1 as a margin.

3. The area specified as a paper margin is removed from the effective coordinate area obtained in 2.

4. The effective coordinate area obtained by performing the above steps 1 to 3 is determined as the document size.

Example:

Assume that the following data is input when Zoom Mode = Output Size, Origin Position = Auto, Paper Margin = 10 mm, Area Determine = IP.

All pen widths are set to 0.1 mm.

The following data does not contain a character size specification command and the physical size of the area specified by IP/IW is A3.

IN;

IP -8399, -5938, 8399, 5938;

IW -8399, -5938, 8399, 5938;

PU;

SP1;

:

:

SP0;

1. [Area Determine] is set to [IP], so the area (-8399, -5938, 8399, 5938) specified by the IP command is determined as the effective coordinate area.

2. The data in the above example contains no character size specification command and all pen widths are 0.1 mm, so the size that is one half the default height of the character on A3 paper (75 plotter unit) is added to the size of the effective coordinate area obtained in 1.
    Effective coordinate area obtained in 2: -8474, -6013, 8474, 6013

3. The area specified by [Paper Margin] (10 mm = 400 plotter unit) is removed from the effective coordinate area obtained in 2.
    Effective coordinate area obtained in 3: -8074, -5613, 8074, 5613

4. The effective coordinate area obtained in 3 is of the A3 size (greater than the A4 size), so the document size is judged as being A3.
    The effective coordinate area obtained when [Paper Margin] is set to [0 mm] is (-8474, -6013, 8474, 6013), so its size is greater than A3 up to A2 inclusive. The document size is judged as being A2.

Determining the Output Size

When the following settings are made on the control panel, the paper size is determined as described below.

• Document Size: Auto

• Paper Tray: Auto

The method of determining the paper size varies depending on the [Output Size] setting and [Zoom Mode] setting on the control panel.

When [Output Size] Is Set to [A size]

The size (A4 or A5) of the paper set in the tray actually becomes the candidate value.

If A-size (A4 or A5) paper is not set in the tray, all A-sizes (A4 and A5) become the candidate values and an error message prompting you to load A-size paper in the tray appears on the control panel.

When [Output Size] Is Set to [Auto]

The size (A4, B5, or A5) of the paper set in the tray actually becomes the candidate value.

If A4, B5, or A5 size paper is not set in the tray, all A-sizes (A4 or A5) become the candidate values and an error message prompting you to load paper in the tray appears on the control panel.

When [Zoom Mode] Is Set to [Output Size]

If the output size which is the same as the document size is supported, select the paper of the size which is the same as the document size.

If the document size is greater than any candidate paper size, select the paper of the largest size.

If the document size is smaller than any candidate paper size, select the paper of the closest size.

When [Zoom Mode] Is Set to [Coordinate Area]

Select the smallest paper that contains the effective coordinate area.

If the size of the effective coordinate area is larger than any candidate paper size, select the paper of the largest size.

If the size of the effective coordinate area is smaller than any candidate paper size, select the paper of the closest size.

Note
• When [Document Size] is set to a value other than [Auto], the output size set on the control panel is assumed to be specified.
• When [Paper Tray] is set to [Auto], the size of the paper set in the tray is assumed to be specified. If the size of the paper set in the tray is not supported, an error message appears to prompt you to set paper of the supported size.

Determining the Scaling Factor

During execution of auto scaling, the scaling factor is determined by the document size and output size. Note that the scaling factor depends on the [Zoom Mode] setting.

Note
- To enable the scaling function, set [Zoom] to [On] on the control panel. If [Zoom] is set at [Off], images will be drawn at a scale of 100%.

When [Document Size] Is Set to [Auto] and [Zoom Mode] Is Set to [Output Size]

The [Hard Clip] setting becomes ineffective. The output size hard clip area is always used.

- When the document size is the same as the output size, the image is drawn at a scale of 100%.
- When the document size is larger than the output size, the image is drawn with it reduced.
- When the document size is smaller than the output size, the image is drawn at a scale of 100%.

Output size / Document	A3	A4	A5	B4	B5
A0	35	25	100	31	100
A1	50	35	25	43	31
A2	71	50	35	61	43
A3	100	71	50	87	61
A4	100	100	71	100	87
A5	100	141	100	173	100

Note
- When origin position is set to layout, the image is drawn with the document laid out at the center. When origin position is set to bottom left or center, the image is drawn with the origins of the document and paper aligned.
- Some output sizes may not be used depending on the printer type.

When [Document Size] Is Set to [Auto] and [Zoom Mode] Is Set to [Coordinate Area]

The [Hard Clip] setting becomes ineffective. The extended hard clip area is always used.

The scaling factor is determined by the effective coordinate area and output size.

The following table summarizes effective coordinate areas by paper size.

Note
• Some output sizes may not be used depending on the printer type.

Unit: Plotter unit

Output size	0 degree				90 degrees			
	Minimum value		Maximum value		Minimum value		Maximum value	
	P2x-P1x	P2y-P1y	P2x-P1x	P2y-P1y	P2x-P1x	P2y-P1y	P2x-P1x	P2y-P1y
A3	7829	5485	73075	51200	5485	7829	51200	73075
A4	5485	3828	51200	35733	3828	5485	35733	51200
A5	3828	2648	35733	24720	2648	3828	44088	35733
B4	6762	4723	63120	44088	4723	6762	44088	63120
B5	4723	3297	44088	30773	3297	4723	30773	44088

The maximum scaling factor is equivalent to 210% of the size of the extended hard clip area of each paper and the minimum scaling factor is equivalent to 22.5%.

Limits During Auto Layout Mapping

When the Hard Disk (Optional) Is Installed in the Printer

Print data is stored to the hard disk when Auto Layout is executed.

When the Hard Disk (Optional) Is Not Installed in the Printer

Print data is stored to the Auto Layout memory when Auto Layout is executed. The initial capacity of the Auto Layout memory is 64 KB. Therefore, this printer cannot correctly output auto layout if the print data received by the auto layout memory exceeds 64 KB. In this case, change the size of the Auto Layout memory from the printer control panel. The upper limit of the Auto Layout memory is 5,120 KB. The auto layout memory cannot accept data larger than 5,120 KB.

We recommend installing the hard disk to this printer if you are going to use the auto layout function.

Examples of Combinations of Functions

This section explains examples of print results obtained by combining the supported functions.

Document Size: Auto, Coord. Rotation: 0, Zoom Mode: Output Size, Zoom: On

Document size   Output size
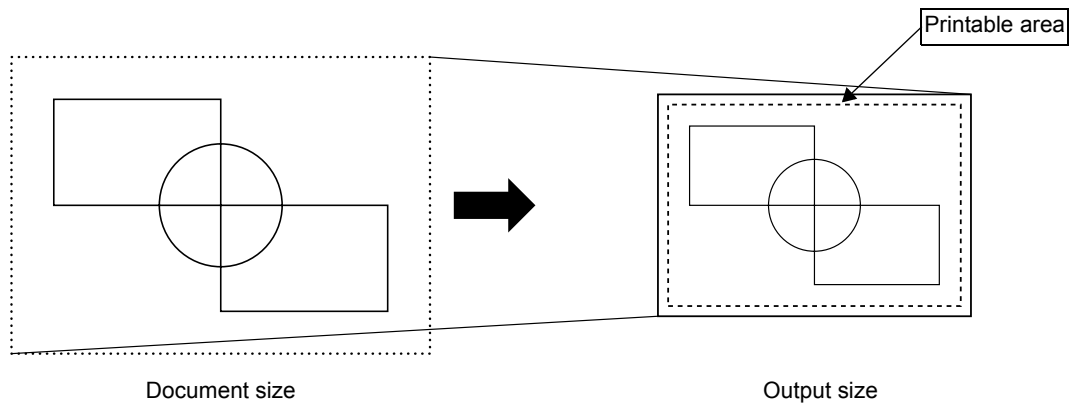
Document Size: Auto, Coord. Rotation: 0, Zoom Mode: Output Size, Zoom: Off

Document size   Output size
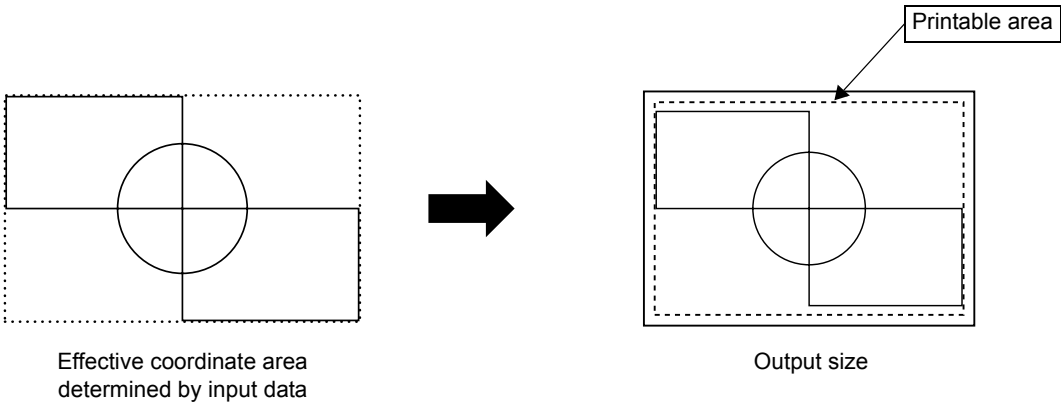
Document Size: Auto, Coord. Rotation: 0, Zoom Mode: Coordinate Area, Zoom: On

Printable area

Effective coordinate area
determined by input data

Output size

Document Size: Auto, Coord. Rotation: 0, Zoom Mode: Coordinate Area, Zoom: Off

Printable area

Effective coordinate area
determined by input data

Output size
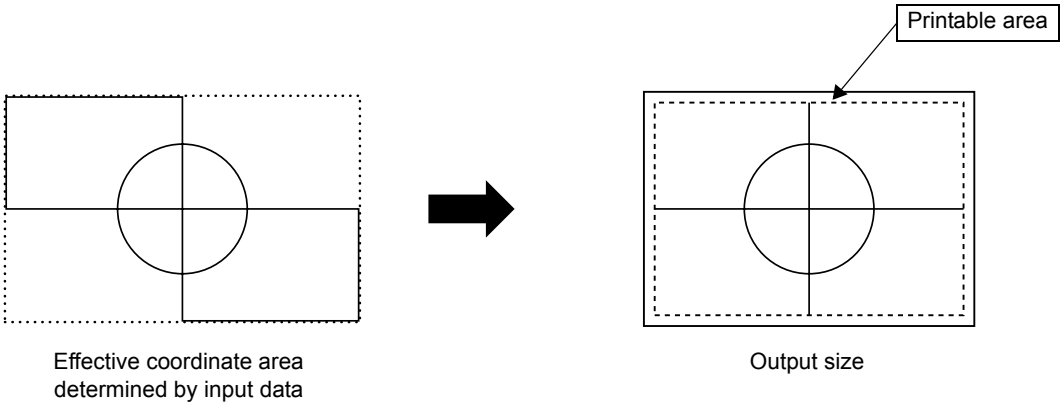
Index

Customer Response Sheet

DocuPrint 240A/340A HP-GL, HP-GL/2 Emulation Settings Guide (ME3216E2-1)
To improve our publications, we would appreciate your feedback regarding this guide. Please take a few moments to complete and return this form to us.

● About Yourself

1. How often do you use this guide?
   [   ] Daily   [   ] Weekly   [   ] Monthly   [   ] Infrequently

2. When do you usually refer to the guide?
   [   ] Doing a usual operation   [   ] Using unfamiliar features
   [   ] Solving a problem

3. Which part of the guide do you read frequently?
   Chapter/Section/Page:

4. Where do you keep this guide?

5. (Optional)
   Your Name: Occupation:
   Company or organization:
   Address:

● About the Guide

	Strongly agree		Neutral		Strongly disagree
1. It is handy.	1	2	3	4	5
2. It is easy to read.	1	2	3	4	5
3. Titles of chapters and sections make sense.	1	2	3	4	5
4. Information is logically placed.	1	2	3	4	5
5. Referencing is easy.	1	2	3	4	5
6. Content is easy to understand.	1	2	3	4	5
7. The step-by-step instructions are easy to follow.	1	2	3	4	5
8. All necessary information is included.	1	2	3	4	5
9. Illustrations aid in the understanding of content.	1	2	3	4	5
10. The use of color is effective.	1	2	3	4	5

Other comments:

After completing this form, detach and send it to the address below.
(Please use your own envelope and postage stamp.)
Thank you for your cooperation.

- ✂ - - - - - - -

Fuji Xerox Co., Ltd.
KSP R&D 2D7
3-2-1, Sakado, Takatsu-ku
Kawasaki-shi, Kanagawa-ken
JAPAN 213-0012.

List of Mode Menu (HP-GL)

Ready to print

Refer to
• PDF, PCL: User Guide

<Menu> button

Options
Default (Bold box)

Print Language
- ESCP
- HPGL
- PDF
- PCL

Features Menu

Paper Tray
- Auto
- Tray 1 xxx
- Tray 2 xxx
- Tray 3 xxx
- Tray 4 xxx

Tray 1 to 4
xxx: Display the stored paper size

<Eject/Set> → Output Size A4
Refer to the [Output Size] menu for the selectable output paper sizes

Output Size

When Paper Tray is set to [Auto]
- A Size
- A4
- A5
- B5
- Auto

When Paper Tray is set to Tray 1, 2, 3 or 4
The output paper size which is set for the Paper Tray is displayed. Cannot be selected.
- A4
- A5
- B5
- 8.5x14
- 8.5x13
- 8.5x11
- **   Unknown size

Document Size
- Auto
- Output Size
- A0
- A1
- A2
- A3
- A4
- A5
- B0
- B1
- B2
- B3
- B4
- B5

Coord. Rotation
- 0
- 90

Gradation Mode
- Grayscale
- Black Pen

Auto Layout
- On
- Off

Palette Setup
- Command
- Stored Jobs

Quantity
- Enter Quantity → 1 Sets   1 to 250 sets, in increments of 1
- Quantity Setup
  - Protocol
  - Stored Jobs
  - Command

2 Sided Print
- Off
- Long Edge Flip
- Short Edge Flip

Output Tray
- Center Tray
- Rear Tray
- OffsetCatchTray

Adjust Position
- Up & Down → 0 mm   -250 to 250 mm, in increments of 1 mm
- Left & Right   -9.8 to 9.8 inches in 0.1 inch increments

Print Control
- HP-GL Mode
  - HP-GL
  - HP-GL/2
- Hard Clip
  - Output Size
  - Normal
- Eject Command
  - SP → Enable / Disable
  - SP0
  - NR → Disable / Enable
  - FR
  - PG
  - AF
  - AH
- Zoom
  - On
  - Off
- Zoom Mode
  - Output Size
  - Coordinate Area
- Area Determine
  - Auto
  - IW
  - IP
  - Adapted
  - PS
- Paper Margin → 0mm   0 to 99 mm, in increments of 1 mm
  - 0.0 to 3.9 inch in 0.1 inch increments
- Image Enhance
  - On
  - Off

Pen Attributes
- Pen Width → No.00 0.3mm → No.00 0.3mm   0 to 15, in increments of 1   0.0 to 25.5 mm, in increments of 1 mm (0.00 to 1.00 inch in 0.01 inch increments)
- Line End → No.00 Cut → No.00 Cut / No.00 Round / No.00 Rectangle   0 to 15, in increments of 1
- Line Intersect → No.00 None → No.00 None / No.00 Cut / No.00 Round / No.00 Join   0 to 15, in increments of 1
- Density → No.00 0 → No.00 0   0 to 15, in increments of 1   0 to 100 in increments of 5

Stored Jobs Menu

At startup
- Factory
- When Jobs are stored in memory
  - No.01
  - ⋮
  - No.10

Retrieve
- Factory
- When Jobs are stored in memory
  - No.01
  - ⋮
  - No.10

Store
- No.01
- No.02
- ⋮
- No.10

Delete
- No.01
- No.02
- ⋮
- No.10
- When Jobs are stored in memory
- When Jobs are not stored in memory
  - Not stored